

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
 - TEXT CUT OFF AT TOP, BOTTOM OR SIDES
 - FADED TEXT
 - ILLEGIBLE TEXT
 - SKEWED/SLANTED IMAGES
 - COLORED PHOTOS
 - BLACK OR VERY BLACK AND WHITE DARK PHOTOS
-
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**



PATENT 717901.16

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: William Plenderleith)
)
U. S. Patent Application Serial Number: 09/989,351)
)
U.S. Filing Date: November 20, 2001)
)
PCT No.: PCT/GB00/01926)
)
International Filing Date: May 22, 2000)
)
Priority Data: May 22, 1999)
(U.K. Patent No. 9911843.2))
)
For: SPORTS VEHICLE)
)
Attorney Docket: 717901.16)

Examiner: Unknown.

Group Art Unit: 3618

Confirmation No. 1758

Customer No. 27128

RECEIVED

APR 14 2003

GROUP 3600


**PREVIOUSLY MADE PRIORITY CLAIM UNDER 35 U.S.C. § 119 BY THE FILING OF
CERTIFIED COPIES OF PRIORITY PATENT APPLICATIONS**

Applicant is hereby submitting certified copies of PCT Application No.
PCT/GB00/01926 that was filed 22 May 2000 and Great Britain Patent Application No.
9911843.2 that was filed 22 May 1999. This perfects the previously made claim to priority.

If you have any questions or comments, please do not hesitate to contact the undersigned
attorney listed below.

Respectfully submitted,

Date: Apr. 19, 2003



Kevin M. Kercher

Reg. No. 33,408

Blackwell Sanders Peper Martin LLP

720 Olive Street, 24th Floor

St. Louis, Missouri 63101

(314) 345-6000

ATTORNEY(S) FOR APPLICANT.

WORLD INTELLECTUAL PROPERTY
ORGANIZATION

世界知识产权组织

ORGANIZACION MUNDIAL
DE LA PROPIEDAD INTELECTUAL



ORGANISATION MONDIALE
DE LA PROPRIÉTÉ INTELLECTUELLE

المنظمة العالمية للملكية الفكرية

ВСЕМИРНАЯ ОРГАНИЗАЦИЯ
ИНТЕЛЛЕКТУАЛЬНОЙ СОБСТВЕННОСТИ



CERTIFICATION

It is hereby certified that the attached copy is a true copy of the record copy of International Application No. PCT/GB00/01926, filed with the United Kingdom Patent Office as receiving Office on 22 May 2000 (22.05.00) and received by the International Bureau on 20 June 2000 (20.06.00), including any pages containing corrections and/or rectifications transmitted by the competent Authority to, and received by, the International Bureau before the completion of the technical preparations for international publication.

By: The International Bureau



Linda Schryver
Head
PCT Examination Section II

RECEIVED
APR 14 2003
GROUP 3600

Date: 21 January 2003 (21.01.03)

Record
Copy

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

PCT/GB 00 / 01926

International Application No.

22 MAY 2000 22.5.2000

International Filing Date

United Kingdom Patent Office
PCT International Application

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired) (12 characters maximum) P23589A/HGR/

Box No. I TITLE OF INVENTION	
"Sports Vehicle"	
Box No. II APPLICANT	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</i>	
PLENDERLEITH William 4 Addison Gardens Douglas Lanark ML11 0PW United Kingdom	
<input checked="" type="checkbox"/> This person is also inventor.	
Telephone No.	
Facsimile No.	
Teleprinter No.	
State <i>(that is, country)</i> of nationality: United Kingdom	State <i>(that is, country)</i> of residence: United Kingdom
This person is applicant for the purposes of: <input checked="" type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</i>	
This person is: <input type="checkbox"/> applicant only <input type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below.)</i>	
State <i>(that is, country)</i> of nationality:	State <i>(that is, country)</i> of residence:
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
<input type="checkbox"/> Further applicants and/or (further) inventors are indicated on a continuation sheet.	
Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE	
The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: <input checked="" type="checkbox"/> agent <input type="checkbox"/> common representative	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)</i>	
Murgitroyd & Company 373 Scotland Street GLASGOW G5 8QA United Kingdom	
Telephone No. 0141 307 8400	
Facsimile No. 0141 307 8401	
Teleprinter No.	
<input type="checkbox"/> Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.	

Box No V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a)(mark the applicable check-boxes: at least one must be marked):

- ☒ **Regional Patent**
☒ **AP** **ARIPO Patent:** GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ **EA** **Eurasian Patent:** AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP** **European Patent:** AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ **OA** **OAPI Patent:** BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line).....

National Patent(if other kind of protection or treatment desired, specify on dotted line):

- | | | | |
|---|---------------------------------------|--|---|
| <input checked="" type="checkbox"/> AE | United Arab Emirates | <input checked="" type="checkbox"/> LC | Saint Lucia |
| <input checked="" type="checkbox"/> AL | Albania | <input checked="" type="checkbox"/> LK | Sri Lanka |
| <input checked="" type="checkbox"/> DZ | Algeria | <input checked="" type="checkbox"/> LR | Liberia |
| <input checked="" type="checkbox"/> AG | Antigua and Barbuda | <input checked="" type="checkbox"/> LS | Lesotho |
| <input checked="" type="checkbox"/> AM | Armenia | <input checked="" type="checkbox"/> LT | Lithuania |
| <input checked="" type="checkbox"/> AT | Austria | <input checked="" type="checkbox"/> LU | Luxembourg |
| <input checked="" type="checkbox"/> AU | Australia | <input checked="" type="checkbox"/> LV | Latvia |
| <input checked="" type="checkbox"/> AZ | Azerbaijan | <input checked="" type="checkbox"/> MA | Morocco |
| <input checked="" type="checkbox"/> BA | Bosnia and Herzegovina | <input checked="" type="checkbox"/> MD | Republic of Moldova |
| <input checked="" type="checkbox"/> BB | Barbados | <input checked="" type="checkbox"/> MG | Madagascar |
| <input checked="" type="checkbox"/> BG | Bulgaria | <input checked="" type="checkbox"/> MK | The former Yugoslav Republic of Macedonia |
| <input checked="" type="checkbox"/> BR | Brazil | <input checked="" type="checkbox"/> MN | Mongolia |
| <input checked="" type="checkbox"/> BY | Belarus | <input checked="" type="checkbox"/> MW | Malawi |
| <input checked="" type="checkbox"/> CA | Canada | <input checked="" type="checkbox"/> MX | Mexico |
| <input checked="" type="checkbox"/> CH and LI | Switzerland and Liechtenstein | <input checked="" type="checkbox"/> NO | Norway |
| <input checked="" type="checkbox"/> CN | China | <input checked="" type="checkbox"/> NZ | New Zealand |
| <input checked="" type="checkbox"/> CR | Costa Rica | <input checked="" type="checkbox"/> PL | Poland |
| <input checked="" type="checkbox"/> CU | Cuba | <input checked="" type="checkbox"/> PT | Portugal |
| <input checked="" type="checkbox"/> CZ | Czech Republic | <input checked="" type="checkbox"/> RO | Romania |
| <input checked="" type="checkbox"/> DE | Germany | <input checked="" type="checkbox"/> RU | Russian Federation |
| <input checked="" type="checkbox"/> DK | Denmark | <input checked="" type="checkbox"/> SD | Sudan |
| <input checked="" type="checkbox"/> DM | Dominica | <input checked="" type="checkbox"/> SE | Sweden |
| <input checked="" type="checkbox"/> EE | Estonia | <input checked="" type="checkbox"/> SG | Singapore |
| <input checked="" type="checkbox"/> ES | Spain | <input checked="" type="checkbox"/> SI | Slovenia |
| <input checked="" type="checkbox"/> FI | Finland | <input checked="" type="checkbox"/> SK | Slovakia |
| <input checked="" type="checkbox"/> GB | United Kingdom | <input checked="" type="checkbox"/> SL | Sierra Leone |
| <input checked="" type="checkbox"/> GD | Grenada | <input checked="" type="checkbox"/> TJ | Tajikistan |
| <input checked="" type="checkbox"/> GE | Georgia | <input checked="" type="checkbox"/> TM | Turkmenistan |
| <input checked="" type="checkbox"/> GH | Ghana | <input checked="" type="checkbox"/> TR | Turkey |
| <input checked="" type="checkbox"/> GM | Gambia | <input checked="" type="checkbox"/> TT | Trinidad and Tobago |
| <input checked="" type="checkbox"/> HR | Croatia | <input checked="" type="checkbox"/> TZ | United Republic of Tanzania |
| <input checked="" type="checkbox"/> HU | Hungary | <input checked="" type="checkbox"/> UA | Ukraine |
| <input checked="" type="checkbox"/> ID | Indonesia | <input checked="" type="checkbox"/> UG | Uganda |
| <input checked="" type="checkbox"/> IL | Israel | <input checked="" type="checkbox"/> US | United States of America |
| <input checked="" type="checkbox"/> IN | India | <input checked="" type="checkbox"/> UZ | Uzbekistan |
| <input checked="" type="checkbox"/> IS | Iceland | <input checked="" type="checkbox"/> VN | Viet Nam |
| <input checked="" type="checkbox"/> JP | Japan | <input checked="" type="checkbox"/> YU | Yugoslavia |
| <input checked="" type="checkbox"/> KE | Kenya | <input checked="" type="checkbox"/> ZA | South Africa |
| <input checked="" type="checkbox"/> KG | Kyrgyzstan | <input checked="" type="checkbox"/> ZW | Zimbabwe |
| <input checked="" type="checkbox"/> KP | Democratic People's Republic of Korea | Check-boxes reserved for designating States (for the purposes of a national patent) which have become party to the PCT after issuance of this sheet: | |
| <input checked="" type="checkbox"/> KR | Republic of Korea | <input checked="" type="checkbox"/> MZ | Mozambique |
| <input checked="" type="checkbox"/> KZ | Kazakhstan | | |

In addition to the designations made above, the applicant also makes under Rule 4.9(b) all designations which would be permitted under the PCT except the designation(s) of _____

The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit).

Sheet No. 3

Box No. VI PRIORITY CLAIM		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application:* regional Office	international application: receiving Office
item (1) 22.05.99 22 May 1999	9911843.2	United Kingdom		
item (2)				
item (3)				

☒ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s): 1

* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

Box No. VII INTERNATIONAL SEARCHING AUTHORITY			
Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):		Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):	
ISA /		Date (day/month/year)	Number Country (or regional Office)

Box No. VIII CHECK LIST; LANGUAGE OF FILING	
This international application contains the following number of sheets: request : 3 description (excluding sequence listing part) : 15 claims : 4 abstract : 1 drawings : 12 sequence listing part of description : 0 Total number of sheets : 35	This international application is accompanied by the item(s) marked below: 1. <input checked="" type="checkbox"/> fee calculation sheet 2. <input type="checkbox"/> separate signed power of attorney 3. <input type="checkbox"/> copy of general power of attorney, reference number, if any: 4. <input type="checkbox"/> statement explaining lack of signature 5. <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s): 6. <input type="checkbox"/> translation of international application into (language): 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input checked="" type="checkbox"/> other (specify): Patents Form 23/77
Figure of the drawings which should accompany the abstract: 1	Language of filing of the international application: English

Box No. IX SIGNATURE OF APPLICANT OR AGENT	
Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request). <div style="text-align: center; font-size: 1.5em;">Murgitroyd & Co.</div> Murgitroyd & Company Agents for the Applicant	

For receiving Office use only		2. Drawings: <input checked="" type="checkbox"/> received: <input type="checkbox"/> not received:
1. Date of actual receipt of the purported international application:	22 MAY 2000 22.05.2000	
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA /	6. <input checked="" type="checkbox"/> Transmittal of search copy delayed until search fee is paid.	

For International Bureau use only	
Date of receipt of the record copy by the International Bureau:	20 JUNE 2000 (20.06.00)

1 **SPORTS VEHICLE**

2

3 This invention relates to a sports vehicle that
4 enables a person to travel downhill over terrain
5 whose surface characteristics would render the use of
6 a skateboard or snowboard impracticable, and in
7 particular to a sports vehicle which may be ridden by
8 a person standing on a platform on the vehicle.

9

10 Devices such as the skateboard and snowboard are well
11 known. The skateboard enables its user to travel
12 over surfaces such as tarmac and concrete, which are
13 relatively smooth and firm. The snowboard enables
14 its user to travel over snow-covered surfaces, which
15 offer a low coefficient of friction. Neither of
16 these devices is suitable for travelling over
17 grassland or any other terrain that lacks the
18 smoothness and firmness required by the skateboard
19 and the low coefficient of friction required by the
20 snowboard.

1 The object of this invention is to provide a device
2 that enables its user to indulge in pursuits similar
3 to skateboarding and snowboarding over terrain such
4 as grassland.

5
6 According to a first aspect of the present invention,
7 there is provided a vehicle for travelling over
8 grassland and similar terrain, said vehicle
9 comprising a generally horizontal platform having
10 attached to its underside one or more rotatable disks
11 each having a lower surface adapted to contact the
12 ground, each of said one or more rotatable disks
13 arranged to rotate about a generally vertical axis,
14 the underside of each of said one or more rotatable
15 disks being substantially convex in form.

16
17 Preferably, said vehicle has two or more rotatable
18 disks arranged along a longitudinal axis of said
19 platform.

20
21 Preferably, said platform is resiliently pliable.
22 Preferably, said platform comprises a first area on
23 its upper side towards the front of said platform
24 adapted to receive one foot of the user, and a second
25 area on its upper side towards the rear of said
26 platform adapted to receive the other foot of the
27 user, said platform comprising a central portion
28 between said first and second areas adapted to flex
29 resiliently about a lateral axis in the plane of said
30 platform. Preferably, said first and second areas
31 are provided with boot or shoe retention means. The

1 platform may further comprise a hinge mechanism
2 extending laterally across said platform to aid
3 pliability. The first area of the platform may be
4 provided with a first rotatably mounted foot support
5 member, while the second area of the platform may be
6 provided with a second rotatably mounted foot support
7 member. Preferably each foot support member is
8 rotatably mounted such that its axis of rotation is
9 substantially coincident with the axis of rotation of
10 a rotatable disk. Preferably said first and second
11 foot support members are each provided with boot or
12 shoe retention means.

13

14 Preferably, said central portion comprises a portion
15 of said platform having a reduced cross-sectional
16 area. Preferably, said central portion comprises a
17 waist portion of the platform having a reduced width.

18

19 In one embodiment the platform may have a generally
20 concave shape in a longitudinal direction in its
21 unstressed state, such that the central portion of
22 the platform is lower than the ends of the platform.

23 In another embodiment the platform may have a
24 generally convex shape in a longitudinal direction in
25 its unstressed state, such that the central portion
26 of the platform is higher than the ends of the
27 platform.

28

29 Preferably, each of said one or more rotatable disks
30 is supported on a spindle attached to the underside
31 of said platform. Preferably, said vehicle further

1 comprises additional support means adapted to provide
2 additional support for each of said one or more
3 rotatable disks in addition to said spindle.

4 Preferably, said additional support means is either a
5 plurality of idler wheels or rollers. Alternatively,
6 each of said one or more rotatable disks is supported
7 solely by either a plurality of idler wheels, a
8 plurality of rollers, or a plurality of balls.

9
10 Preferably, each of said one or more rotatable disks
11 is solid.

12
13 Alternatively, each of said one or more rotatable
14 disks is hollow, said upper surface of each of said
15 one or more rotatable disks being substantially
16 concave in form. Preferably, said platform is shaped
17 so as to follow the form of said concave upper
18 surface of each of said one or more hollow rotatable
19 disks.

20
21 Preferably, the lower surface of each of said one or
22 more rotatable disks is substantially in the form of
23 part of the surface of a sphere. Alternatively, the
24 lower surface of each of said one or more rotatable
25 disks may be substantially in the form of part of the
26 surface of an ellipsoid, a truncated cone, or a
27 truncated toroid.

28
29 Preferably, said vehicle further comprises means for
30 the attachment of a sail, to permit the user to
31 traverse substantially level terrain.

1 Preferably, the platform and rotatable disks are made
2 of composite plastics materials, and the other parts
3 that support the rotatable disks are made of metal,
4 but the platform may instead be made of natural
5 materials, such as wood, and the rotatable disks may
6 be made of metal.

7
8 According to a second aspect of the present invention
9 there is provided a vehicle for travelling over
10 grassland and similar terrain, said vehicle
11 comprising a substantially horizontal platform having
12 attached to its underside three or more rotatable
13 disks arranged longitudinally, at least one of said
14 rotatable disks having a first inclined axis, and at
15 least one rotatable disk having a second inclined
16 axis inclined in the opposite sense to said first
17 inclined axis.

18
19 A preferred embodiment of the invention will now be
20 described with reference to the accompanying drawings
21 in which:

22
23 Figs. 1a and 1b show a side elevation and plan view
24 respectively of a vehicle according to the invention,
25 with the mounting spindle shown schematically;

26
27 Figs. 2a and 2b show an end elevation and plan view
28 respectively of the vehicle of Fig. 1 with the
29 platform parallel to the ground;

30

1 Figs. 3a and 3b show an end elevation and plan view
2 respectively of the vehicle of Fig. 1 with the
3 platform tilted to one side;

4
5 Figs. 4a and 4b show a side elevation and plan view
6 respectively of the vehicle of Fig. 1 when positioned
7 on a sloping surface;

8
9 Figs. 5a and 5b show a side elevation and plan view
10 respectively of another vehicle according to the
11 invention having two rotatable disks with the
12 platform flat, the mounting spindles being shown
13 schematically;

14
15 Figs. 6a and 6b show a side elevation and plan view
16 respectively of the vehicle of Fig. 5 with the
17 platform curved upwards towards its ends;

18
19 Figs. 7a and 7b show a side elevation and plan view
20 respectively of the vehicle of Fig. 5 with the
21 platform curved downwards towards its ends;

22
23 Fig. 8a shows a longitudinal section through a
24 vehicle according to the invention showing the
25 rotatable disk mounting arrangement with a central
26 spindle;

27
28 Fig. 8b is an enlarged view of part of the
29 longitudinal section of Fig. 8a;

30

1 Fig. 9 shows a transverse section through a solid
2 rotatable disk of the vehicle of Fig. 8a;

3

4 Fig. 10 shows a transverse section through a hollow
5 rotatable disk;

6

7 Fig. 11 shows a transverse section through a
8 rotatable disk mounting arrangement with no central
9 spindle of another vehicle according to the
10 invention;

11

12 Fig. 12 shows a transverse section through another
13 platform according to the invention in which the
14 platform follows the form of the rotatable disks;

15

16 Figs. 13a and 13b show a side elevation and an end
17 elevation respectively of a vehicle according to a
18 further embodiment of the invention;

19

20 Fig. 14 shows a plan view of a vehicle according to a
21 further embodiment of the invention having rotatable
22 foot supports; and

23

24 Fig. 15 shows a plan view of the vehicle of Fig. 15
25 with the foot supports in a rotated position.

26

27 In the embodiments illustrated in Figs. 1 to 4, the
28 vehicle according to the invention comprises a
29 platform 1 capable of supporting the user and having
30 on its underside one or more rotatable disks 2. Each
31 rotatable disk 2 rotates about a spindle 3, which is

1 attached at one end to the underside of the platform
2 with its axis perpendicular to the underside of the
3 platform. The user stands on the platform, with his
4 feet in approximately the position 4 shown in Fig. 1,
5 and he may adopt a crouching stance to enable him to
6 grip handgrips 5 located at each end of the platform.

7
8 When the platform 1 is parallel to the ground, as
9 shown in Fig. 2, the point of contact 20 with the
10 ground 30 of each rotatable disk 2 (as seen in plan
11 view) is coincident with the centre of the rotatable
12 disk 2, and any force applied in the plane of the
13 platform 1 will not result in a turning moment being
14 applied to the rotatable disks 2. However, when the
15 platform 1 is tilted to one side, as shown in Fig. 3,
16 the point of contact 22 of each disk 2 with the
17 ground 30 is not coincident with the centre 24 of the
18 rotatable disk 2, and a force applied to the platform
19 1 will normally cause a turning moment to be applied
20 to the rotatable disks 2.

21
22 As shown in Fig. 4, when the platform 1 is resting on
23 a sloping surface 32 of sufficient gradient, and is
24 tilted in a direction other than the direction of
25 maximum gradient, the turning moment induced in the
26 rotatable disks 2 is sufficient to overcome the
27 friction that exists at the point of contact 22 with
28 the ground 32, and the device travels in a downhill
29 direction.

30

1 Fig. 5 shows an embodiment of the vehicle of the
2 invention having two rotatable disks 2 and a pliable
3 platform 1 with handgrips 5 at each end. When the
4 platform 1 is flat, the imaginary lines 40 joining
5 the centre 24 of each rotatable disk 2 to its point
6 of contact 22 with the ground (as seen in plan view)
7 are perpendicular to the longitudinal axis of the
8 platform, and the vehicle travels in the direction of
9 the longitudinal axis, indicated by the arrow 42.
10 However, if the ends 44 of the platform are pulled
11 upwards by the user pulling on the handgrips 5,
12 causing the platform 1 to assume a curvature of the
13 type shown in Fig. 6, that is a concave curvature of
14 the upper face of the platform 1, the imaginary lines
15 46 joining the centre 24 of each rotatable disk 2 to
16 its point of contact 22a with the ground are no
17 longer perpendicular to the longitudinal axis and the
18 vehicle steers towards the side 45 to which it has
19 been tilted, in the direction of the arrow 48.
20 Conversely, if the ends 44 of the platform 1 are
21 pushed downwards by the user, causing the platform to
22 assume a curvature of the type shown in Fig. 7, that
23 is a convex curvature of the upper face of the
24 platform 1, the device steers towards the opposite
25 side, in the direction of arrow 52. The imaginary
26 lines 50 joining the centre 24 of each rotatable disk
27 2 to its point of contact 22b with the ground are not
28 perpendicular to the longitudinal axis and the
29 vehicle steers away from the side to which it has
30 been tilted.
31

1 Figs. 8a and 8b show a detailed embodiment of a
2 vehicle according to the invention. In this
3 embodiment, handgrips 5a are provided in the form of
4 a longitudinal extension of the platform 1 at each
5 end of the platform beyond the outer edge of the
6 adjacent rotatable disk 2. A metal spindle 3 is
7 attached by bolts 60 or other means to the underside
8 of the platform 1. Rolling element bearings 6 are
9 fitted between the spindle 3 and the rotatable disk 2
10 to reduce the friction and wear arising from rotation
11 of the rotatable disk on the spindle, and the
12 assembly is made secure by a nut 7 secured to the
13 threaded end 62 of the spindle 3, so that the two
14 bearings 6 are held between the nut 7 and a shoulder
15 64 provided at the upper end of the spindle 3.

16
17 The underside of each of the rotatable disks 2 may
18 take a variety of forms, including a segment of a
19 sphere, a segment of an ellipsoid, a truncated cone,
20 a truncated toroid or a combination of these forms.
21 The choice of form is dictated by the contact area
22 required to prevent the rotatable disk sinking into
23 the ground; the nature of the undulations inherent in
24 the terrain over which the device is to be used; and
25 the requirement that the device should not be unduly
26 difficult to balance.

27
28 The rotatable disks 2 may be of solid construction,
29 as shown in Fig. 9, or hollow construction, as shown
30 in Fig. 10. The material may be a mouldable plastic
31 or resin, metal, alloy, composite or any material

1 which can be formed and has the requisite strength
2 and stiffness. Hollow rotatable disks have an outer
3 shell 70 and may have internal ribs 76 (shown in Fig.
4 13a) to increase their stiffness. Where hollow
5 construction is used, as shown in Fig. 10, one or
6 more idler wheels 8 may be employed to provide
7 additional support to the rotatable disks 2, as shown
8 in Fig 10. Each idler wheel is rotatably mounted on
9 a bracket (not shown) which is fixed to the underside
10 of the platform 1. The wheel 8 is oriented so that
11 its axis of rotation 72 is parallel to the contact
12 surface 74 on the disk 2. The provision of idler
13 wheels 8 serves to reduce the bending moment which
14 must be withstood by the spindle 3 and its bolted
15 connection to the platform 1. It is to be understood
16 that roller or balls may be used to support the edges
17 of the disks 2 in the same way as the idler wheels 8
18 described above.

19
20 Fig. 11 shows an alternative form of rotational
21 support by means of which a disk 2 may be rotatably
22 mounted on the platform 1. A plurality of balls 9
23 are mounted circumferentially in a ball support
24 channel formed by an outer flange 80 attached to the
25 disk 2 and an inner flange 82 mounted securely to the
26 underside of the platform 1. It is to be understood
27 that other forms of roller or ball bearing which
28 extend around the circumference of the rotatable disk
29 2 may be used.

30

1 Where hollow rotatable disks 2 are used, the platform
2 1 may be formed in such a way that it follows the
3 form of the upper surface 90 of the rotatable disks
4 2, as shown in Fig. 12. The user's feet are placed
5 in the concave section of the platform 1. This
6 configuration enables the user to remain closer to
7 the ground and to stand on a surface that is
8 approximately parallel to the ground, since if the
9 user applies weight at a point 92 to one side of the
10 longitudinal axis of the platform 1, then the vehicle
11 1 will tilt about the longitudinal axis so that the
12 point 94 on the disk 2 comes into contact with the
13 ground 30 and the adjacent part of the platform at
14 point 92 is substantially parallel to the ground 30.
15 In addition, this concave section could be adapted to
16 provide a flat, horizontal surface for the user's
17 feet when the platform is tilted to the appropriate
18 angle, if the upper surface is profiled to the shape
19 shown by the dotted line 96.

20

21 A further embodiment of the invention is shown in
22 Fig. 13 which has three rotatable disks 2 mounted on
23 the underside of the platform 1. The two rotatable
24 disks 2a at the ends of the platform 1 are tilted by
25 a particular tilt angle about the longitudinal axis
26 of the platform 1 in one direction, whilst the
27 central rotatable disk 2b is angled by the same or
28 similar tilt angle in the opposite direction. With
29 this arrangement, the platform 1 remains horizontal,
30 but the vehicle can still be steered by deflection of
31 the platform 1 as with the other embodiments.

1 Figs. 14 and 15 illustrate an embodiment in which the
2 top of the platform 1 is provided with rotatable foot
3 support members 100 which are connected by a
4 rotatable hinge 102 to a point on the upper surface
5 of the platform 1 corresponding to the centre of
6 rotation of the disk 2. The foot support members 100
7 in the illustrated embodiment are in the form of
8 rigid plates, which may have rollers, bearings or
9 low-friction coatings (not shown) on their underside
10 so that they can rotate freely with respect to the
11 platform 1. The same spindle 3 used to mount the
12 rotatable disk 2 can also be used to mount the hinge
13 102. In this way the foot support members 100 can
14 rotate about axes coincident with the axes of the
15 rotatable disks 2. The user places his feet on the
16 foot support members 100 and applies his weight
17 through his heels in the normal manner to tilt the
18 platform to one side. If he then moves his heels
19 closer together and thereby rotates the foot support
20 members 100 to the position 100a in Fig. 15, then the
21 platform will assume a "concave up" position, as
22 shown in Fig. 6, causing the vehicle to steer to one
23 side. If he moves his heels further apart and
24 thereby rotates the foot support members 100 to the
25 position 100b in Fig. 15, then the platform will
26 assume a "concave down" position, as shown in Fig. 7,
27 causing the vehicle to steer to the other side. The
28 foot support members may be of any suitable shape and
29 may be fitted with boot or shoe retention devices,
30 such as a simple toe strap 104 or any device of the

1 sort known in the art of snowboarding, skiing and
2 roller skating.

3

4 The device could also be provided with means to which
5 a sail and mast may be attached, if the user was to
6 traverse substantially level terrain. The attachment
7 of such a sail would therefore enable the user to
8 cross terrain with the minimum of effort being
9 required.

10

11 Pliability of the platform 1 may be achieved by
12 constructing it entirely of flexible materials, or by
13 using a combination of rigid materials in the
14 vicinity of the user's feet and flexible materials
15 for the middle portion. A region of reduced cross-
16 sectional area may also be incorporated in the
17 platform to facilitate deflection, or a mechanical
18 hinge (not shown) may be employed, which extends
19 across the width of the platform. The hinge may have
20 some form of damping arrangement, to prevent the
21 platform being too flexible.

22

23 The illustrated embodiments show the platform 1 to
24 have a generally flat shape in the unstressed state.
25 However it is to be understood that the platform may,
26 in its unstressed condition, have a concave or convex
27 upper surface, of the form illustrated in Figs 6a or
28 7a respectively. Having such a shape will give the
29 vehicle a natural tendency to steer to one side or
30 the other in the absence of a specific deflection of
31 the platform by the user. In such circumstances a

1 user can adopt a zigzag course by standing on one
2 side of the platform 1 while proceeding on a first
3 leg of the zigzag course, then at the turning point
4 rotating the board through 180° about a vertical axis
5 and standing on what is effectively the other side of
6 the platform 1 while proceeding on the second leg of
7 the zigzag course.

8
9 These and other modifications and variations are
10 possible without departing from the scope of the
11 invention.

1 CLAIMS

2

3 1. A vehicle for travelling over grassland and
4 similar terrain, said vehicle comprising a generally
5 horizontal platform having attached to its underside
6 one or more rotatable disks each having a lower
7 surface adapted to contact the ground, each of said
8 one or more rotatable disks arranged to rotate about
9 a generally vertical axis, the underside of each of
10 said one or more rotatable disks being substantially
11 convex in form.

12

13 2. A vehicle according to Claim 1, wherein said
14 vehicle has two or more rotatable disks arranged
15 along a longitudinal axis of said platform.

16

17 3. A vehicle according to Claim 1, wherein said
18 vehicle has two rotatable disks arranged along a
19 longitudinal axis of said platform.

20

21 4. A vehicle according to any preceding Claim,
22 wherein said platform is resiliently pliable.

23

24 5. A vehicle according to any preceding Claim,
25 wherein said platform comprises a first area on its
26 upper side towards the front of said platform adapted
27 to receive one foot of the user, and a second area on
28 its upper side towards the rear of said platform
29 adapted to receive the other foot of the user, said
30 platform comprising a central portion between said

1 first and second areas adapted to flex resiliently
2 about a lateral axis in the plane of said platform.
3

4 6. A vehicle according to Claim 5, wherein the
5 first area of the platform is provided with a first
6 rotatably mounted foot support member, and the second
7 area of the platform is provided with a second
8 rotatably mounted foot support member.
9

10 7. A vehicle according to Claim 6, wherein each
11 foot support member is rotatably mounted such that
12 its axis of rotation is substantially coincident with
13 the axis of rotation of a rotatable disk.
14

15 8. A vehicle according to Claim 6 or 7, wherein
16 said first and second foot support members are each
17 provided with boot or shoe retention means.
18

19 9. A vehicle according to any preceding Claim,
20 wherein said central portion comprises a portion of
21 said platform having a reduced cross-sectional area.
22

23 10. A vehicle according to any preceding Claim,
24 wherein the platform has a generally concave shape in
25 a longitudinal direction in its unstressed state,
26 such that the central portion of the platform is
27 lower than the ends of the platform.
28

29 11. A vehicle according to any one of Claims 1 to 9,
30 wherein the platform has a generally convex shape in
31 a longitudinal direction in its unstressed state,

1 such that the central portion of the platform is
2 higher than the ends of the platform.

3
4 12. A vehicle according to any preceding Claim,
5 wherein each of said one or more rotatable disks is
6 supported on a spindle attached to the underside of
7 said platform.

8
9 13. A vehicle according to Claim 12, wherein said
10 vehicle further comprises additional support means
11 adapted to provide additional support for each of
12 said one or more rotatable disks in addition to said
13 spindle.

14
15 14. A vehicle as claimed in Claim 13, wherein said
16 additional support means is a plurality of idler
17 wheels.

18
19 15. A vehicle as claimed in Claim 13, wherein said
20 additional support means is a plurality of rollers.

21
22 16. A vehicle as claimed in any of Claims 1 to 12,
23 wherein each of said one or more rotatable disks is
24 supported by a support means selected from the group
25 of support means comprising a plurality of idler
26 wheels, a plurality of rollers, and a plurality of
27 balls.

28
29 17. A vehicle according to any preceding Claim,
30 wherein each of said one or more rotatable disks is
31 solid.

1 18. A vehicle according to any one of Claims 1 to
2 16, wherein each of said one or more rotatable disks
3 is hollow, said upper surface of each of said one or
4 more rotatable disks being substantially concave in
5 form.

6
7 19. A vehicle according to Claim 18, wherein said
8 platform is shaped so as to follow the form of said
9 concave upper surface of each of said one or more
10 hollow rotatable disks.

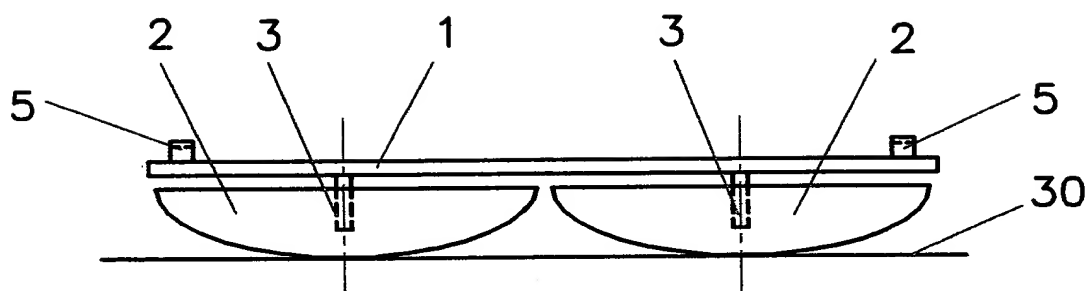
11
12 20. A vehicle according to any preceding Claim,
13 wherein the lower surface of each of said one or more
14 rotatable disks is substantially in the form of part
15 of the surface of a sphere, an ellipsoid, a truncated
16 cone, or a truncated toroid.

17
18 21. A vehicle according to Claim 1, wherein the
19 platform has attached to its underside three or more
20 rotatable disks arranged longitudinally, the axis of
21 rotation of at least one of said rotatable disks
22 being inclined in a first rotational sense about the
23 longitudinal axis of the platform, and the axis of
24 rotation of at least one other rotatable disk being
25 inclined in an opposite rotational sense about the
26 longitudinal axis of the platform.

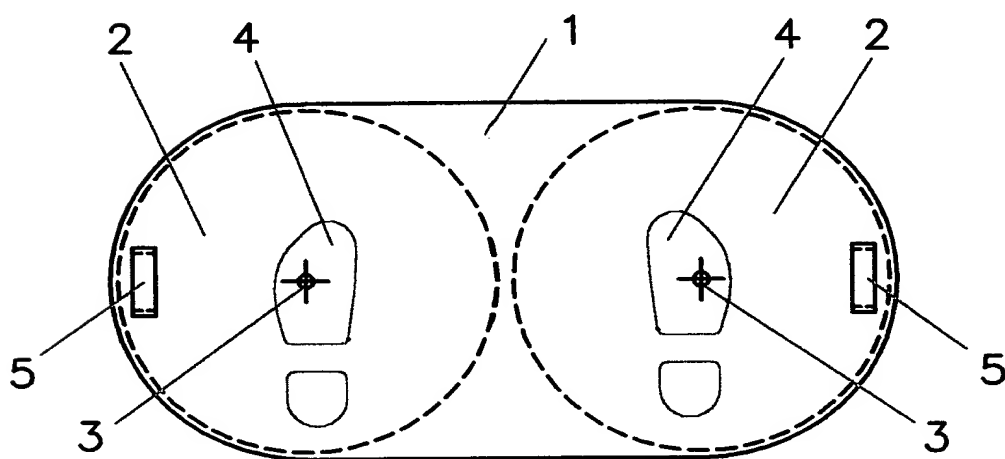
1 **ABSTRACT**

2
3 A sports vehicle includes a substantially horizontal
4 platform (1) capable of supporting the user and
5 having attached to its underside two or more
6 rotatable disks (2) arranged to rotate about
7 substantially vertical axes (3), the underside of
8 each rotatable disk being substantially convex in
9 form. The platform is resilient and can adopt a
10 convex or concave shape, so as to steer the vehicle.
11 The user places his feet on the platform and steers
12 the vehicle by tilting the platform using his body
13 weight. The vehicle enables its user to travel over
14 grassland and similar terrain in a manner similar to
15 skateboarding and snowboarding.

1/12



(a)



(b)

FIG.1

2/12

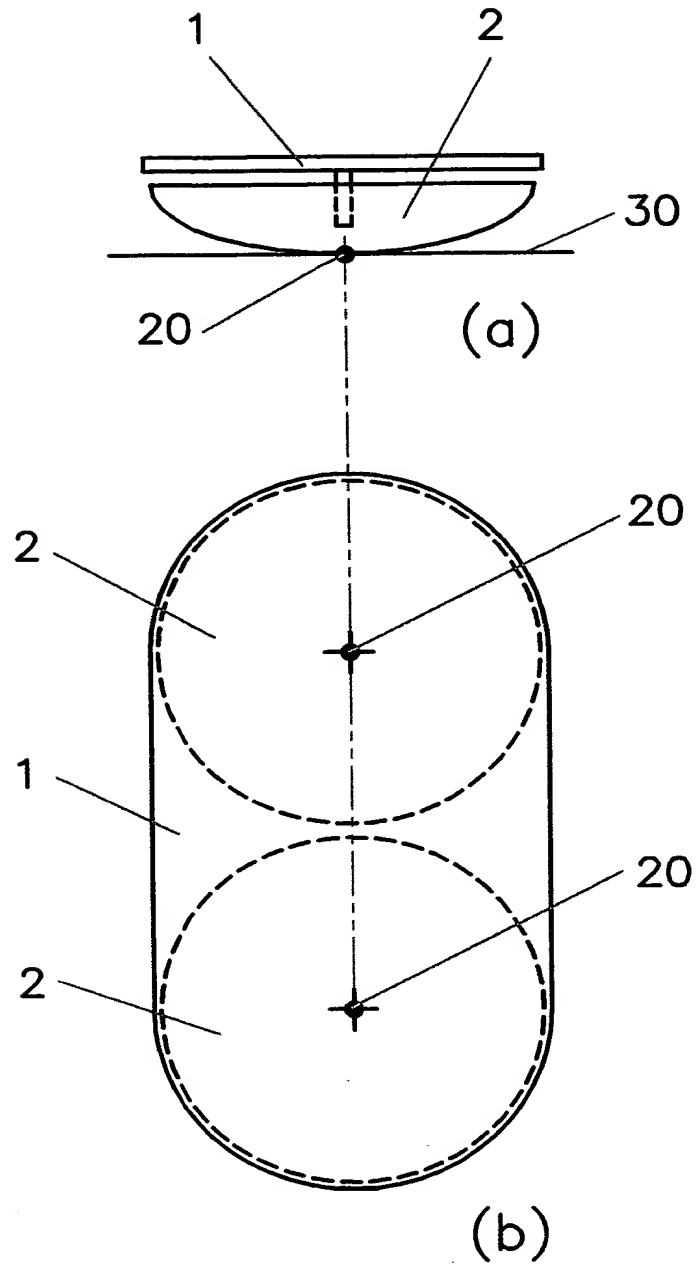


FIG.2

3/12

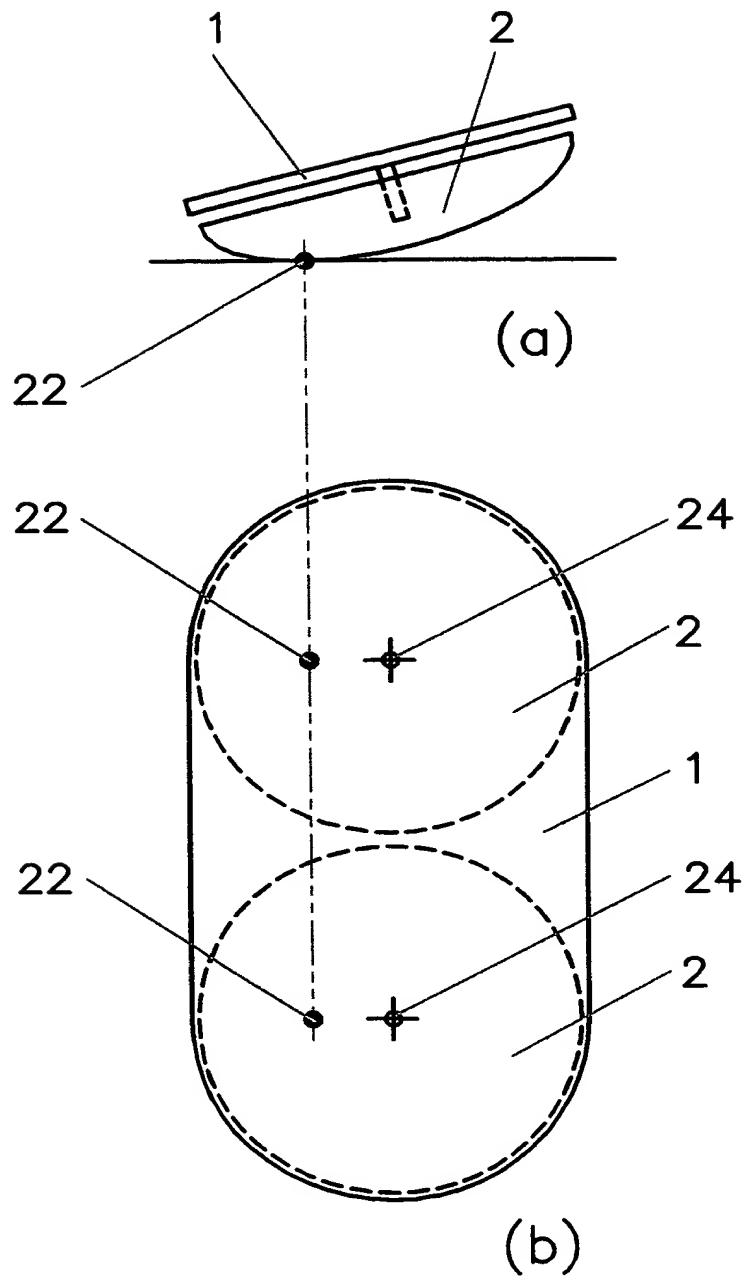


FIG.3

4/12

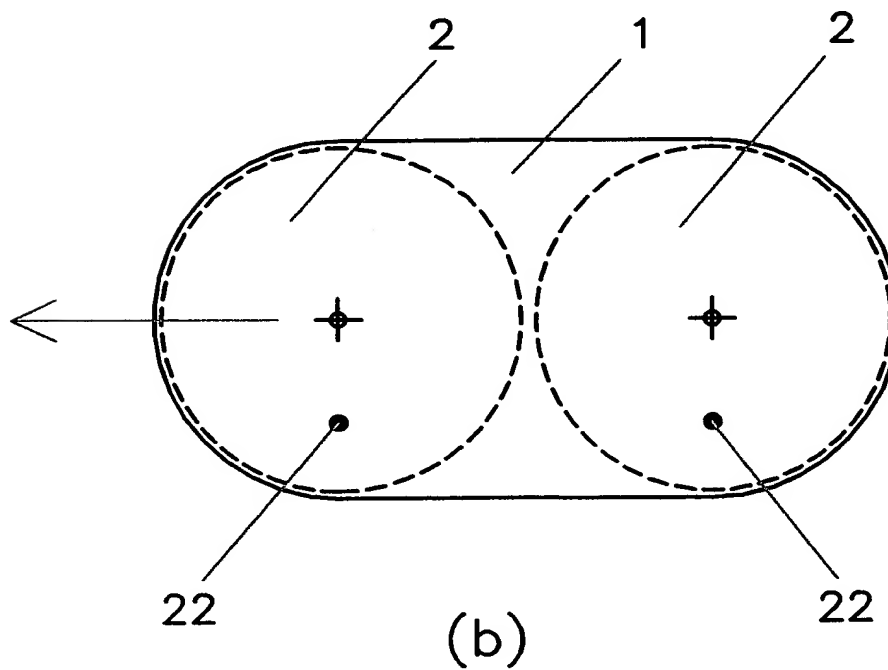
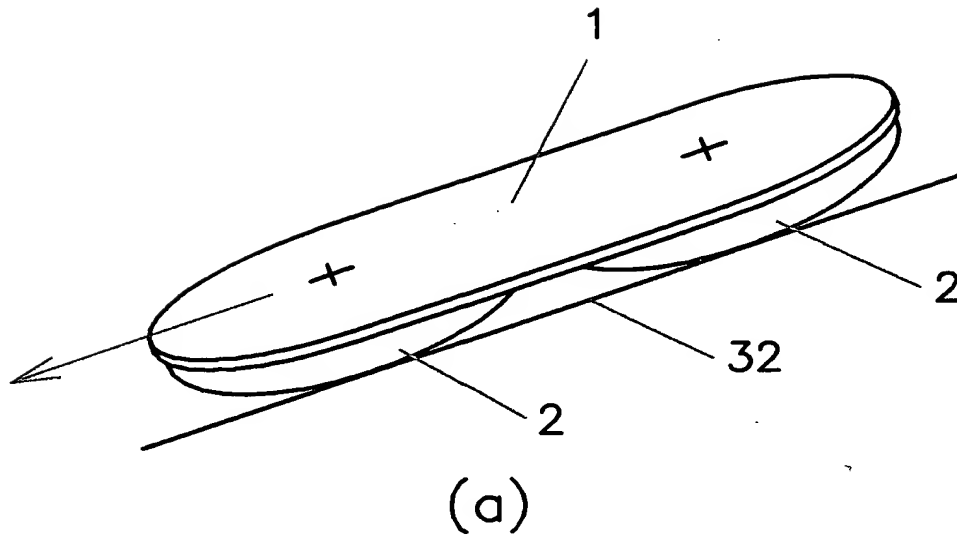
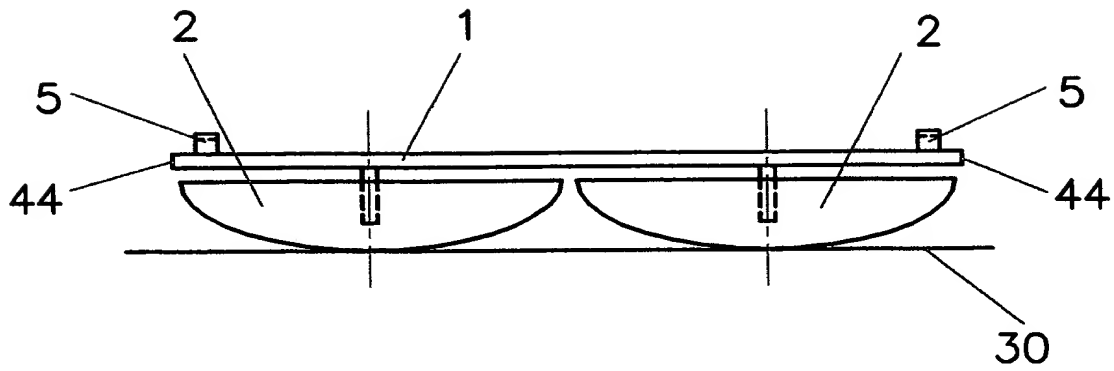
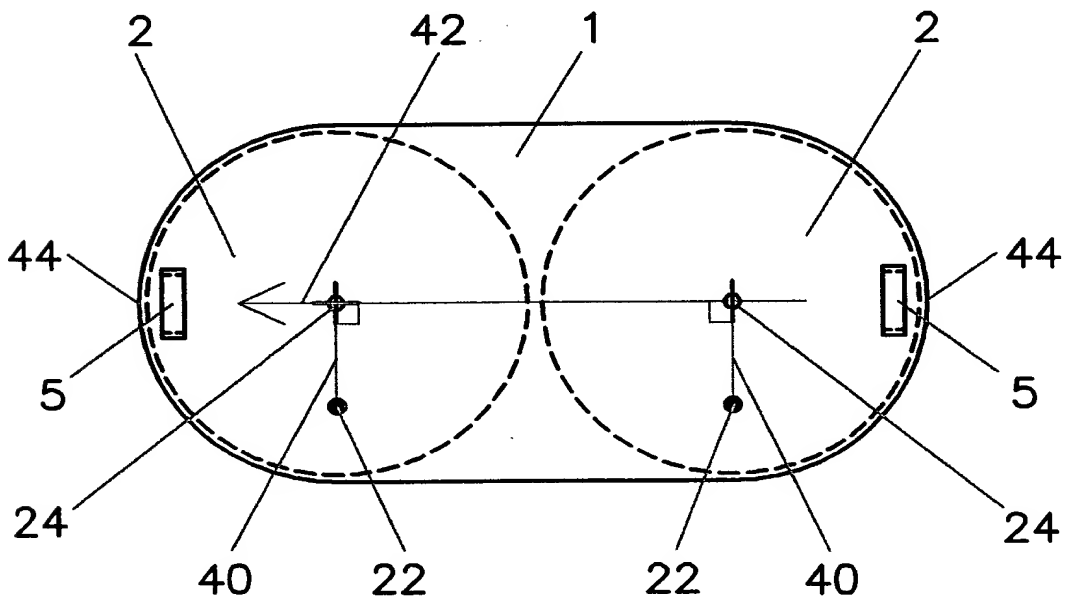


FIG.4

5/12



(a)



(b)

FIG.5

6/12

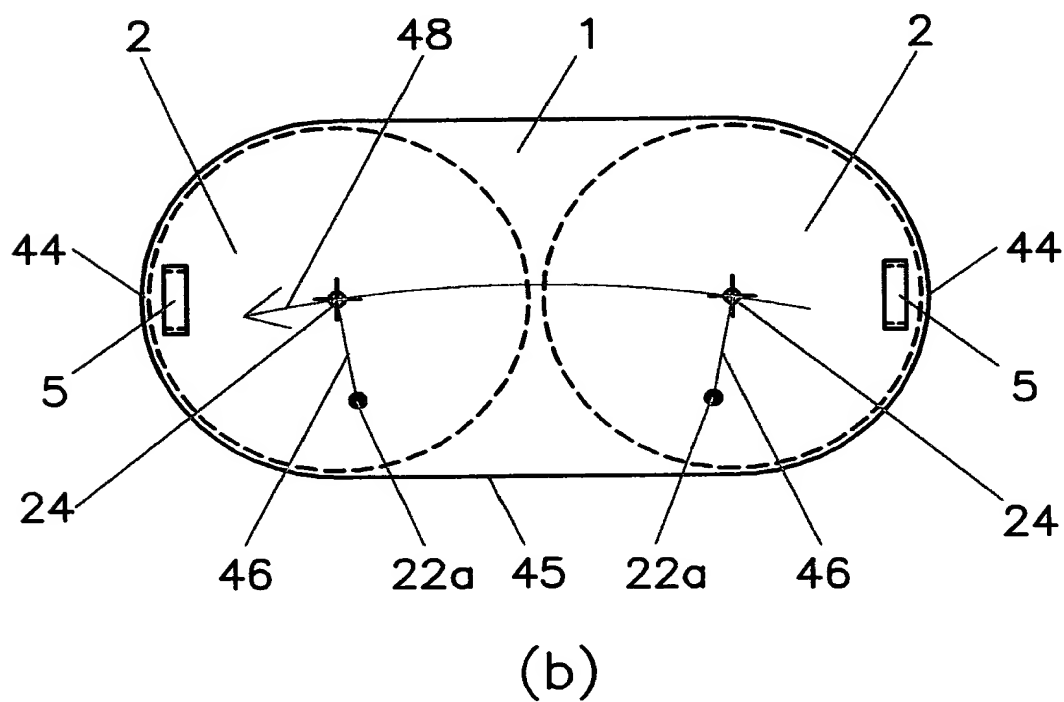
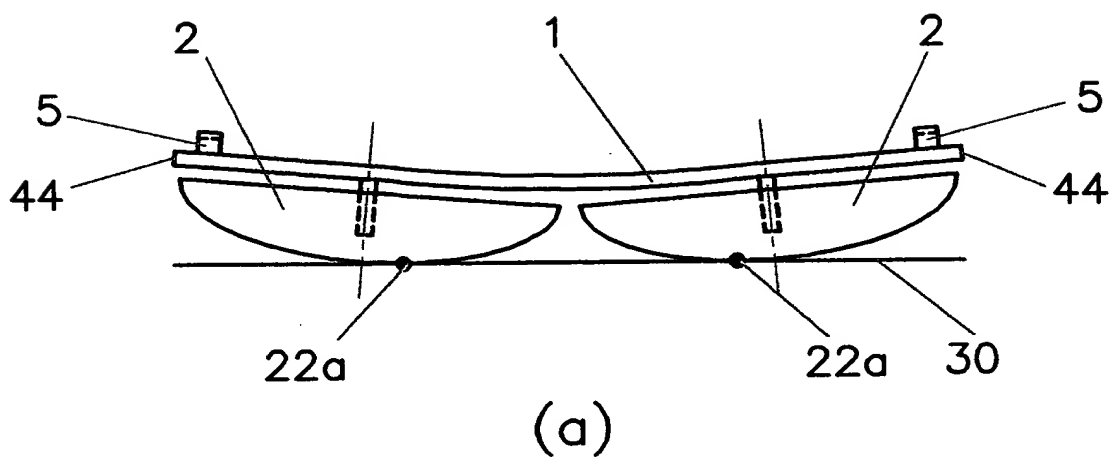
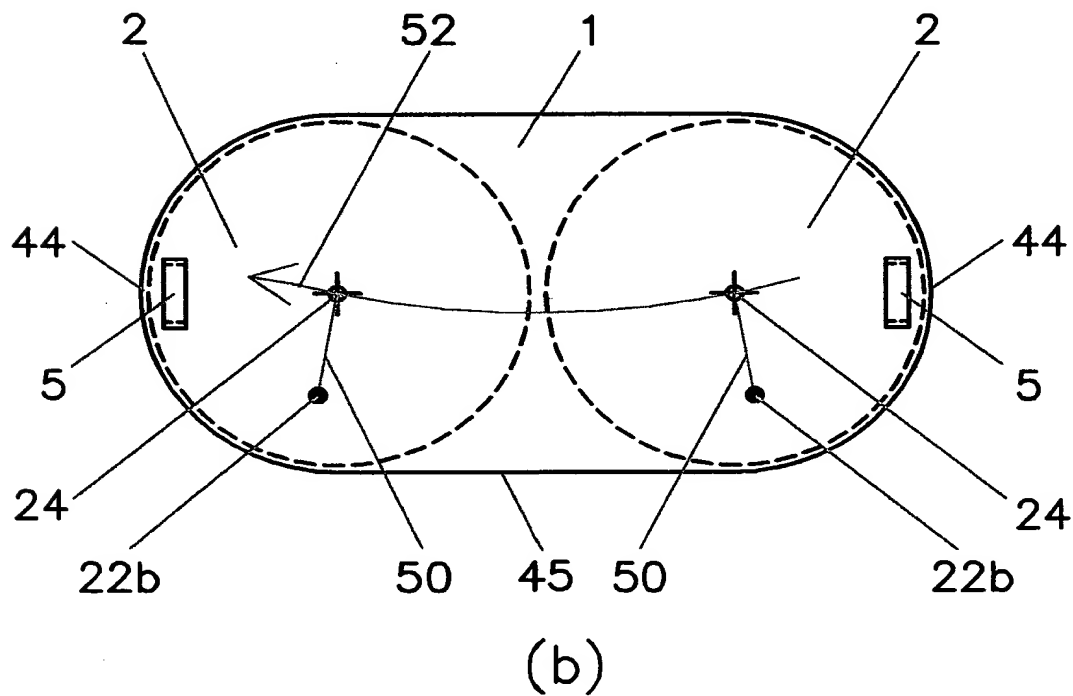
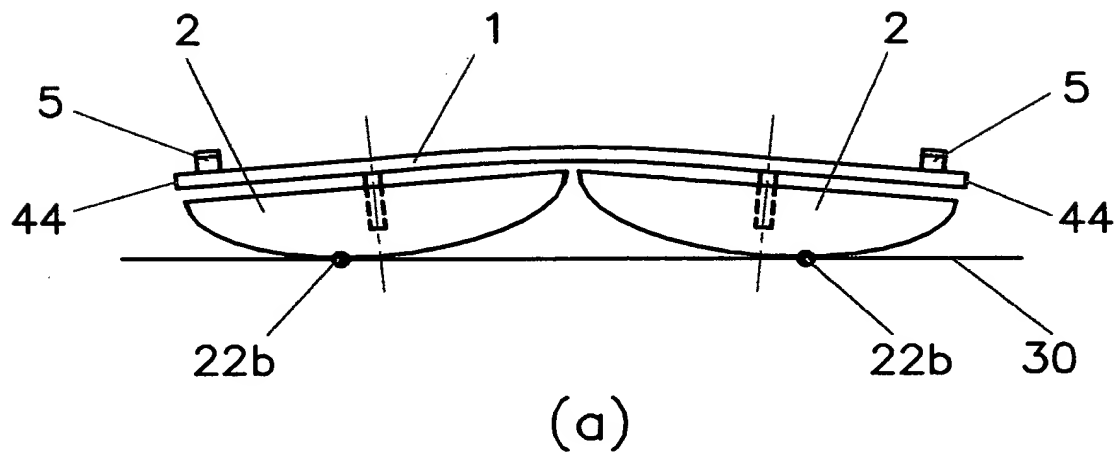


FIG.6

7/12

FIG.7

8/12

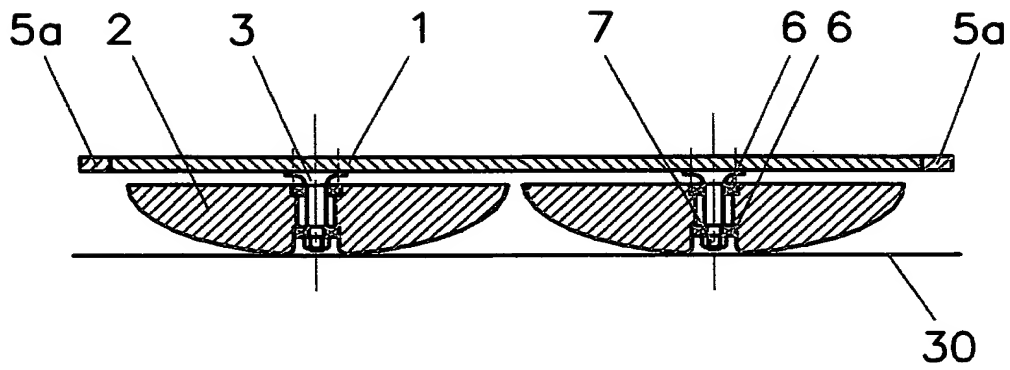


FIG. 8a

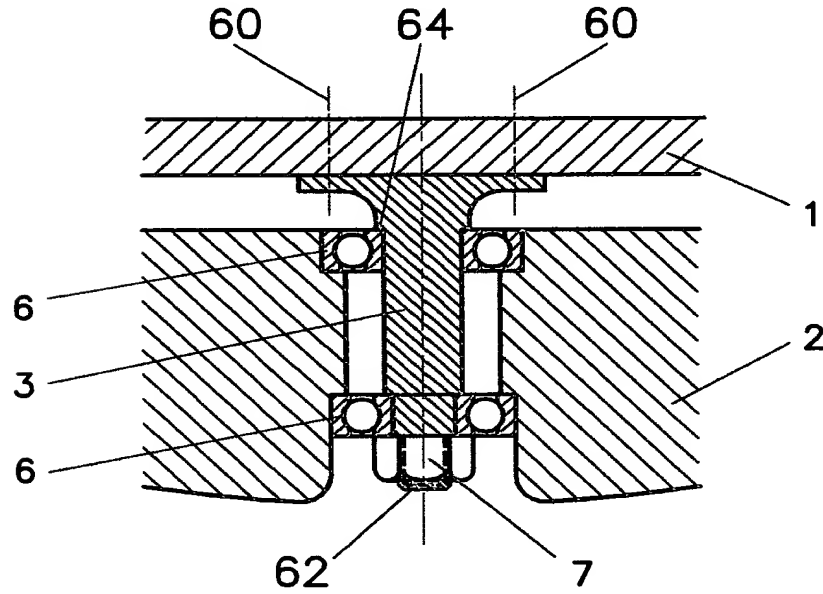


FIG. 8b

9/12

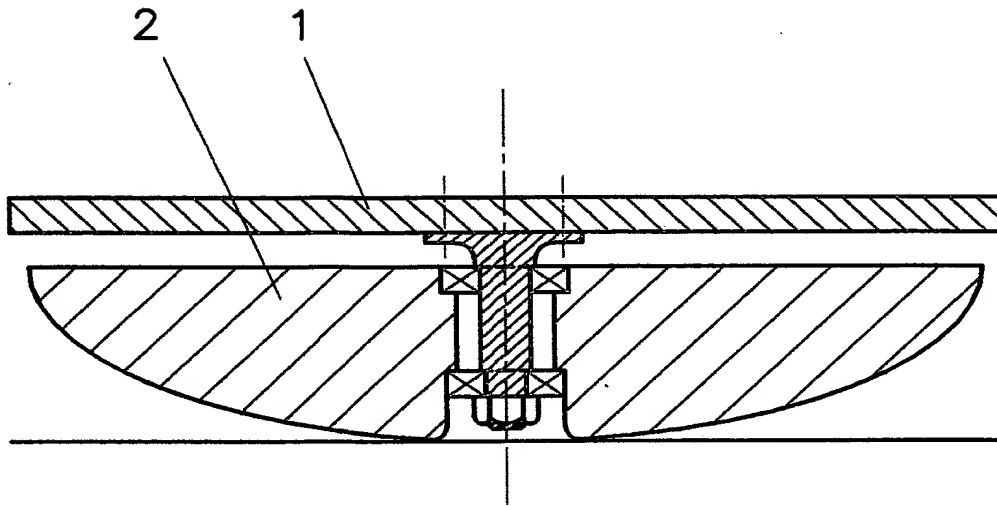


FIG. 9

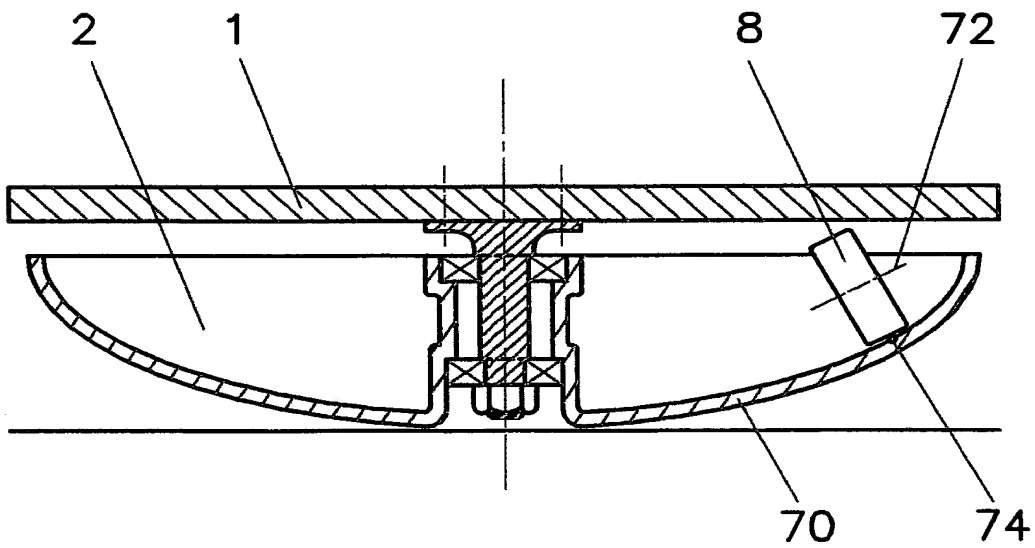


FIG. 10

10/12

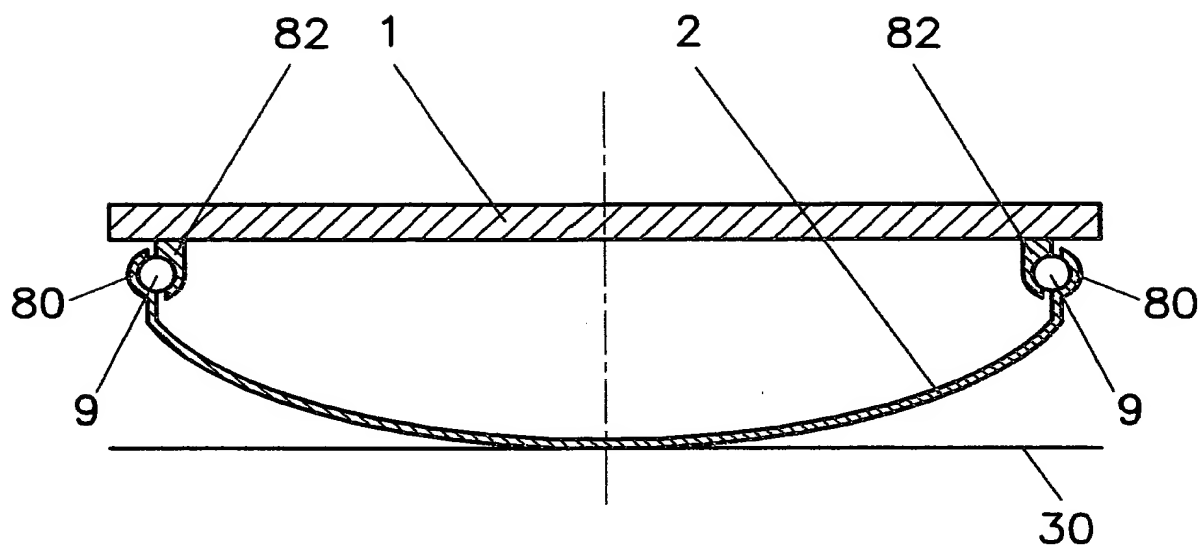


FIG.11

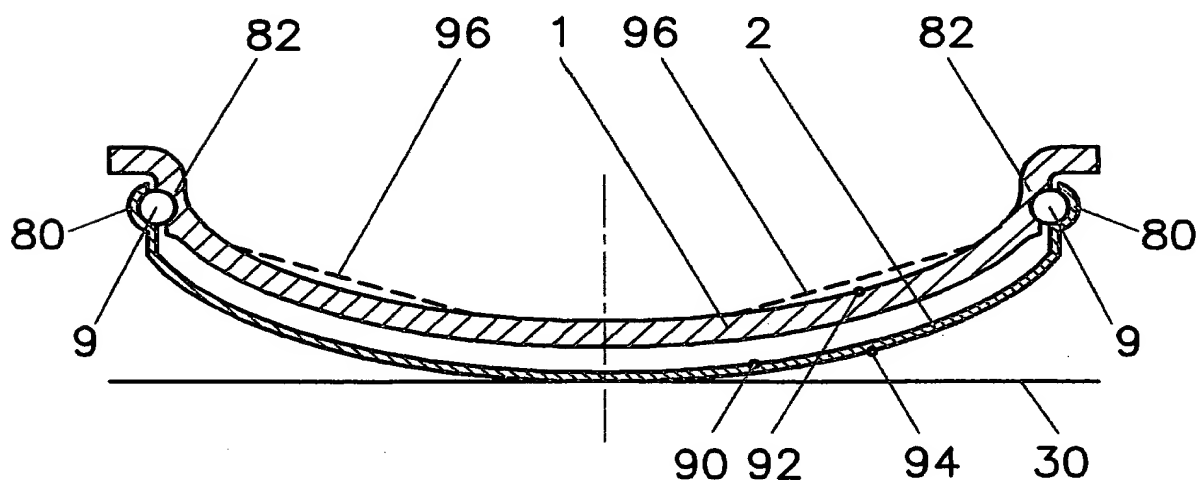


FIG.12

11/12

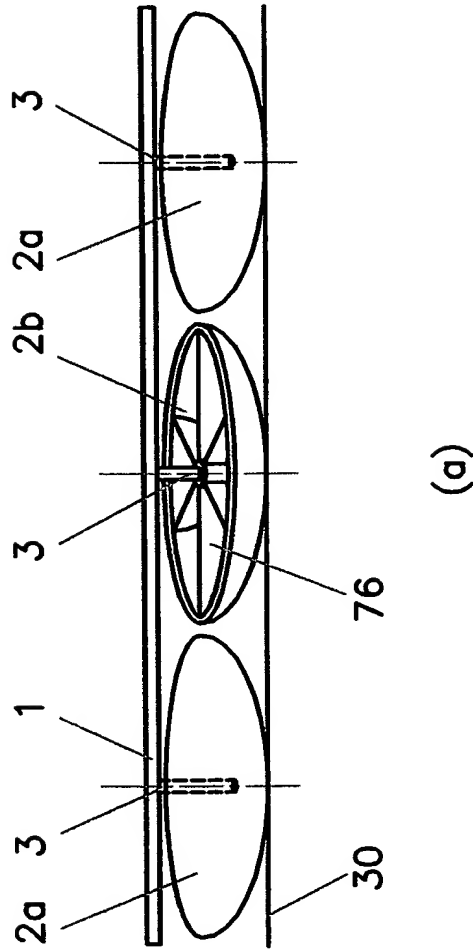
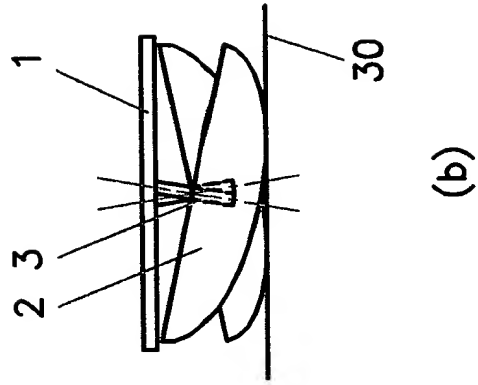


FIG.13

12/12

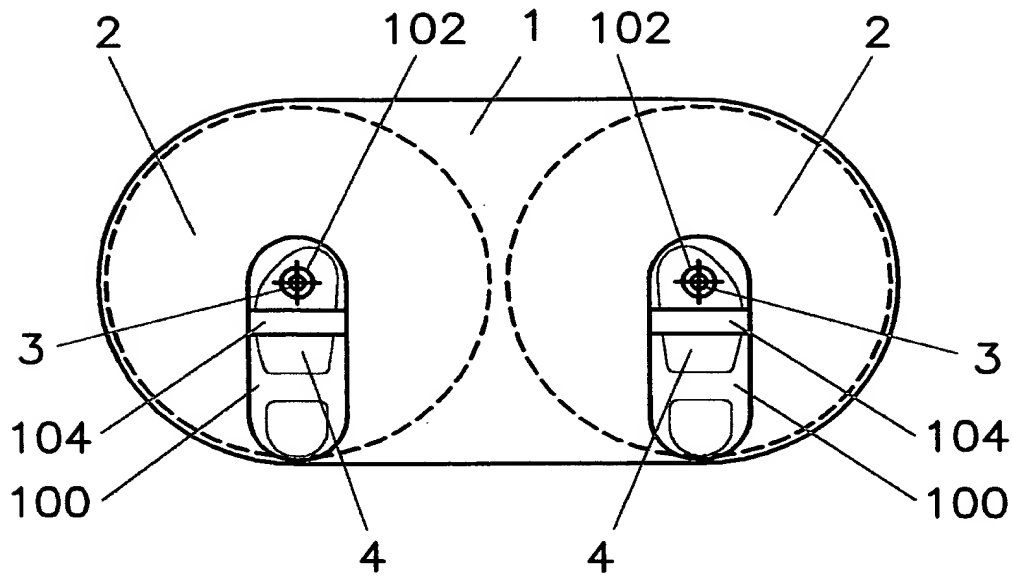


FIG. 14

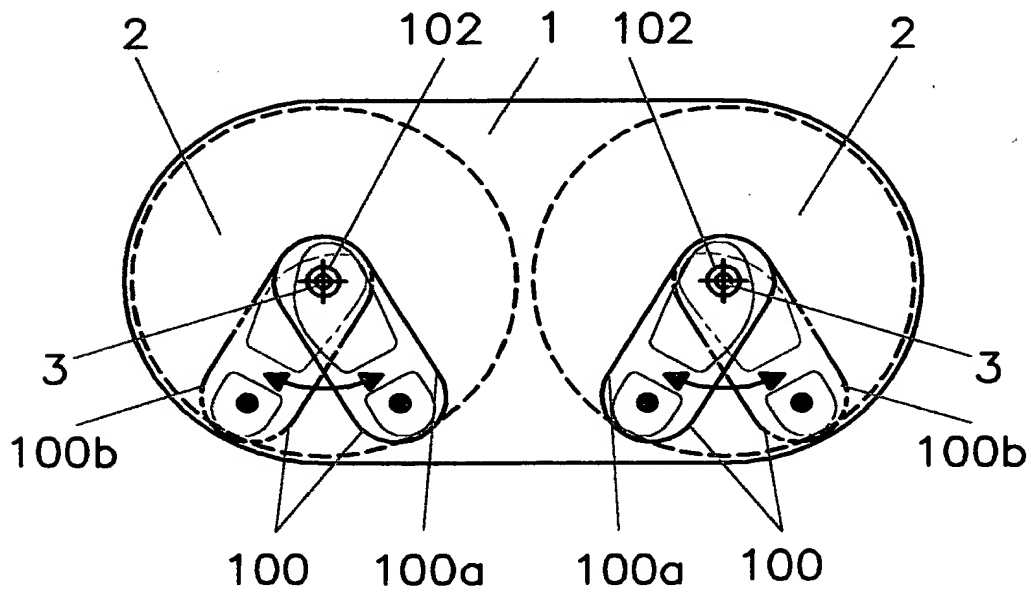
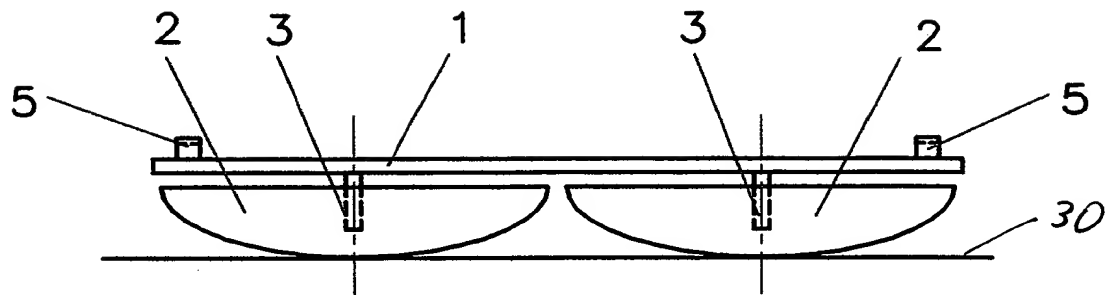
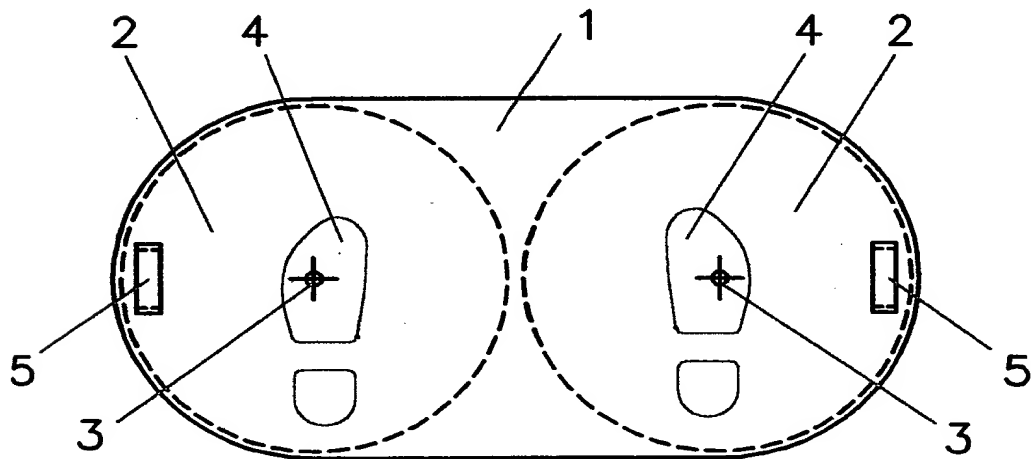


FIG. 15



(a)



(b)

FIG.1

REPLACED

2/12

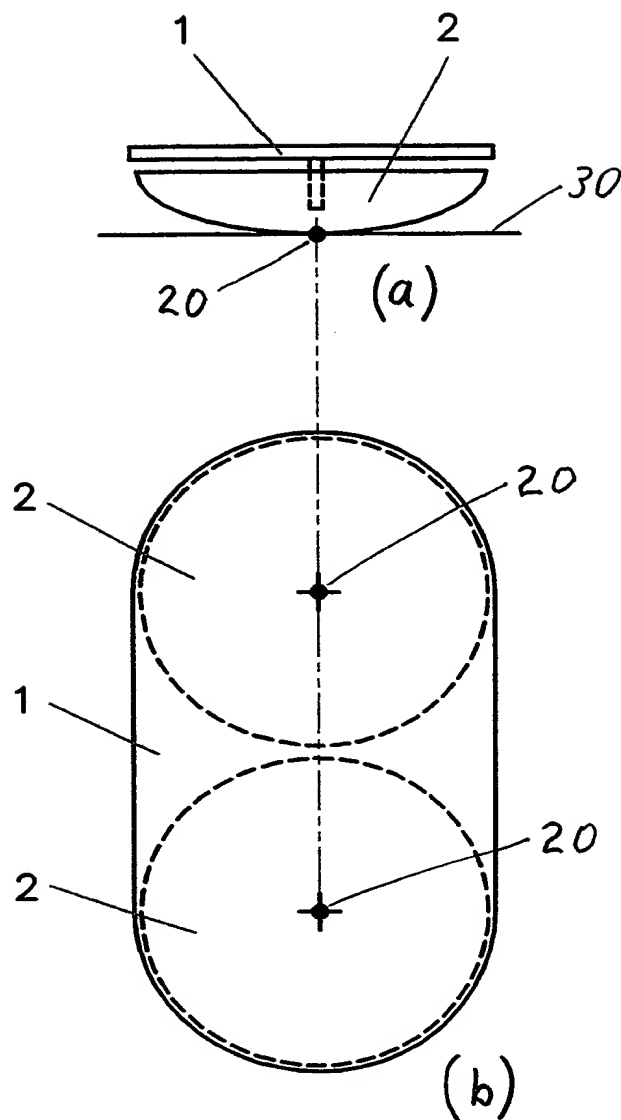


FIG.2

REPLACED

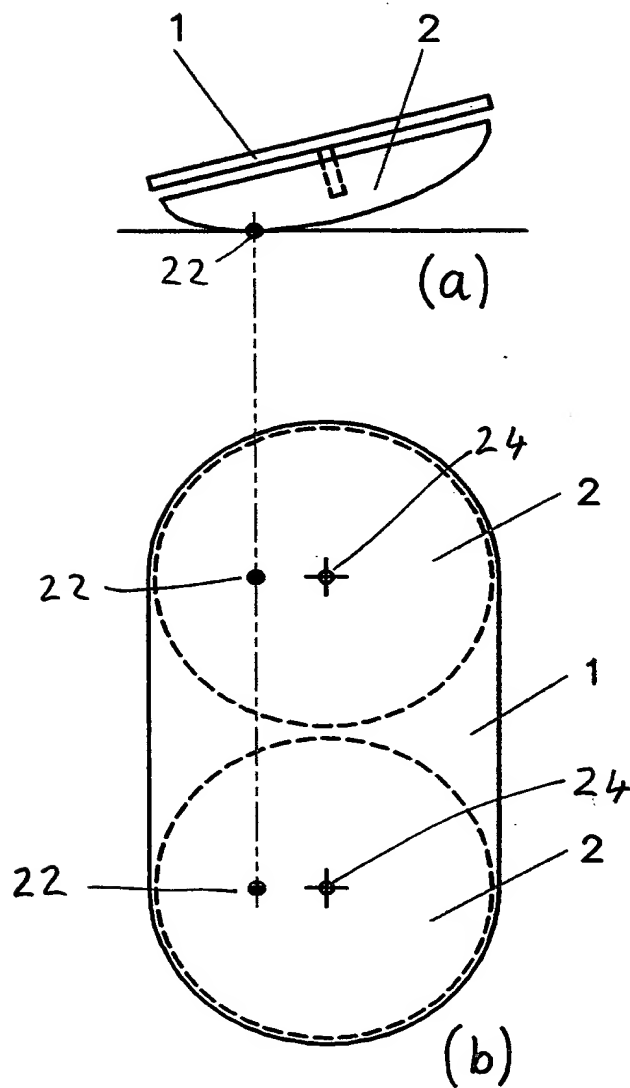


FIG.3

4/12

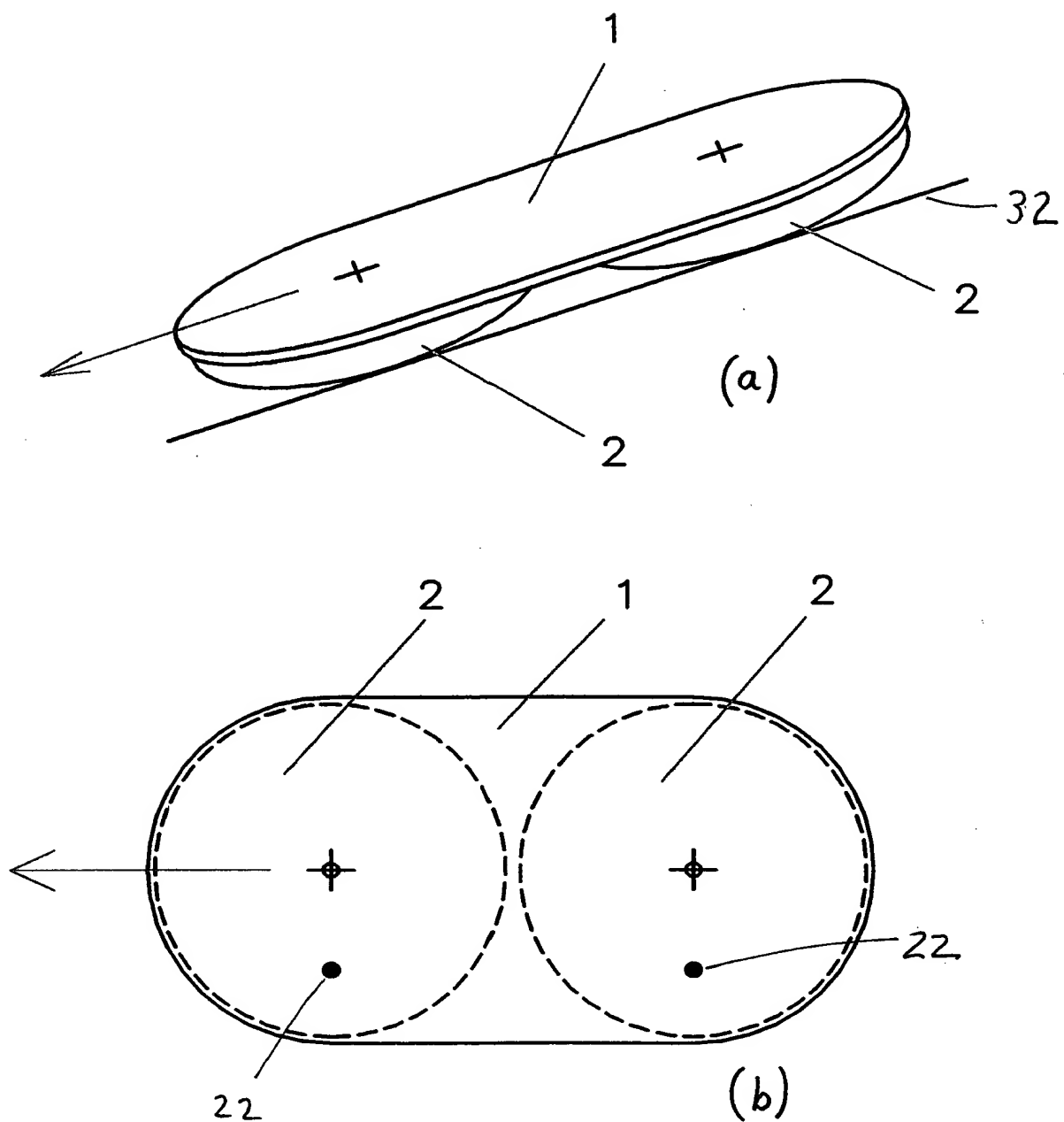


FIG. 4

REPLACED

5/12

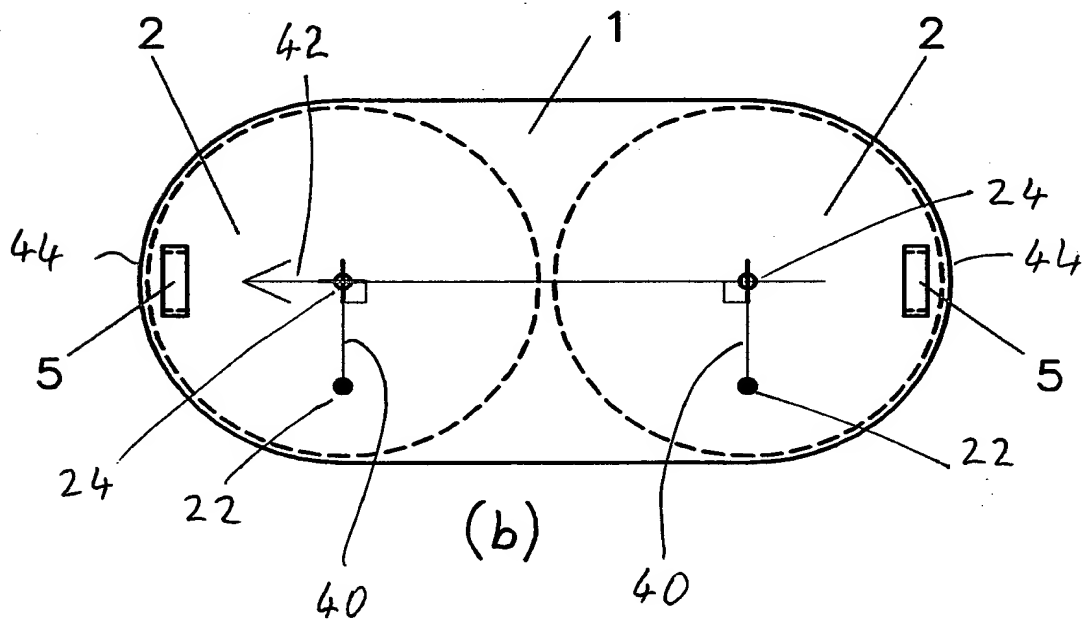
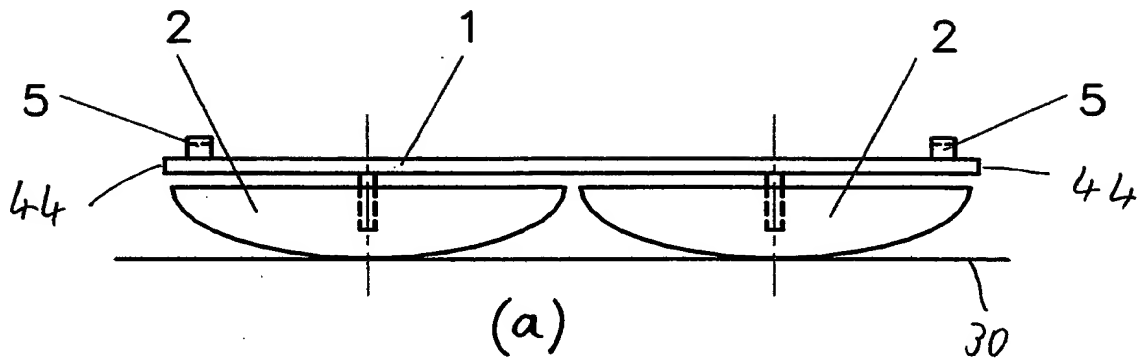


FIG.5

REPLACED

6/12

LT/GB 00/01926

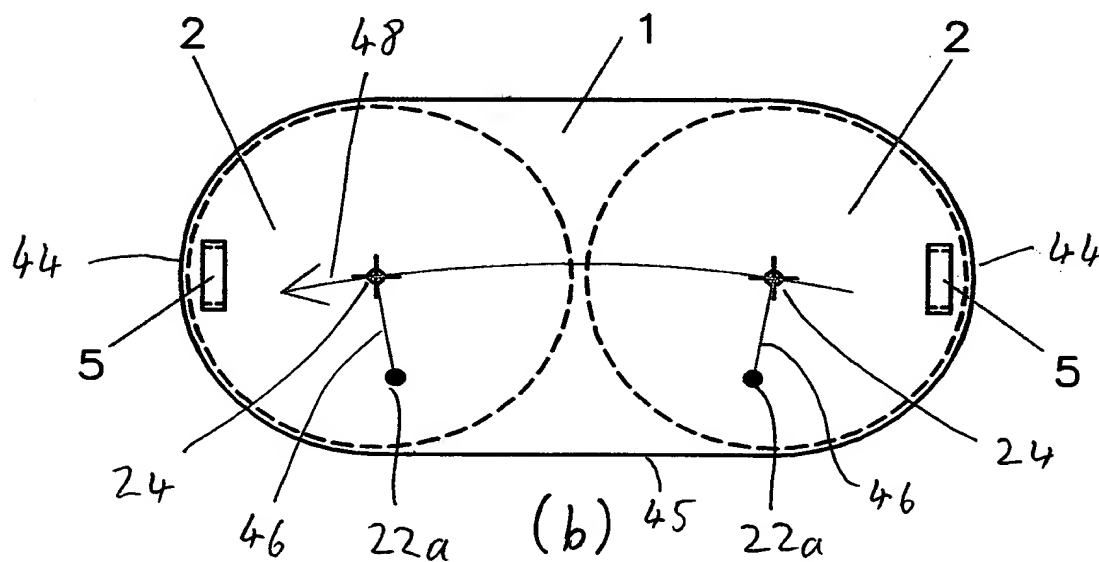
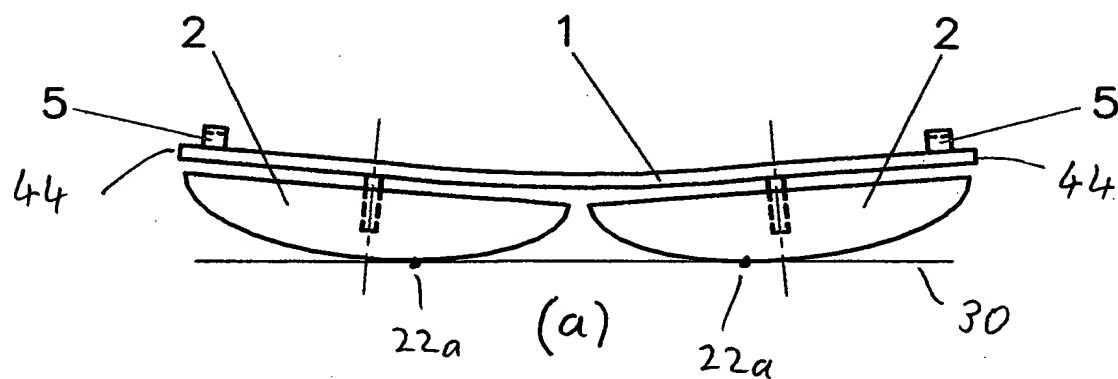


FIG.6

REPLACED

7/12

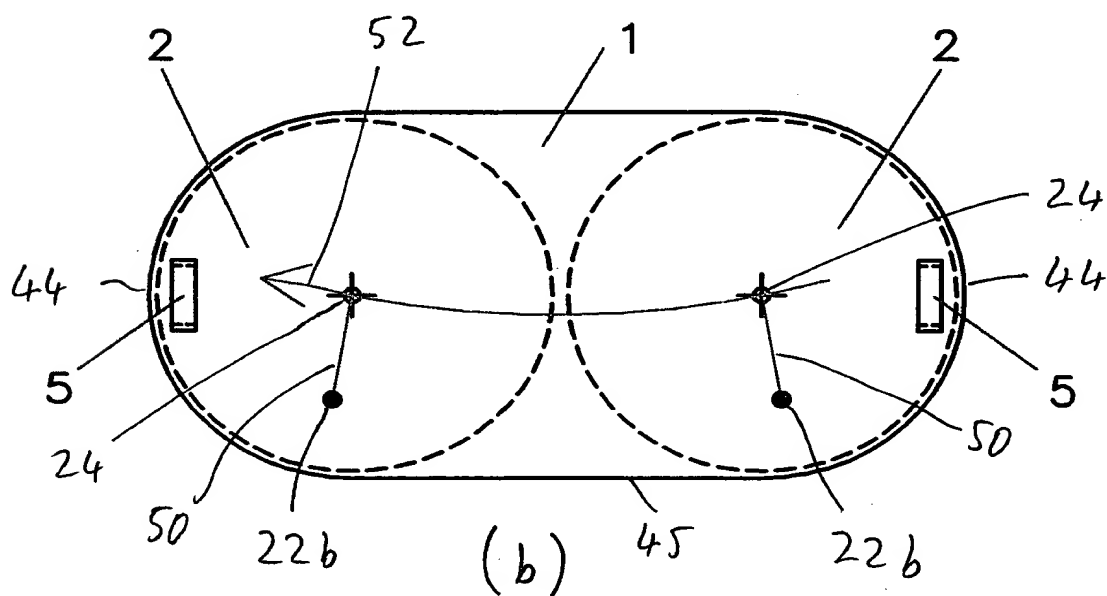
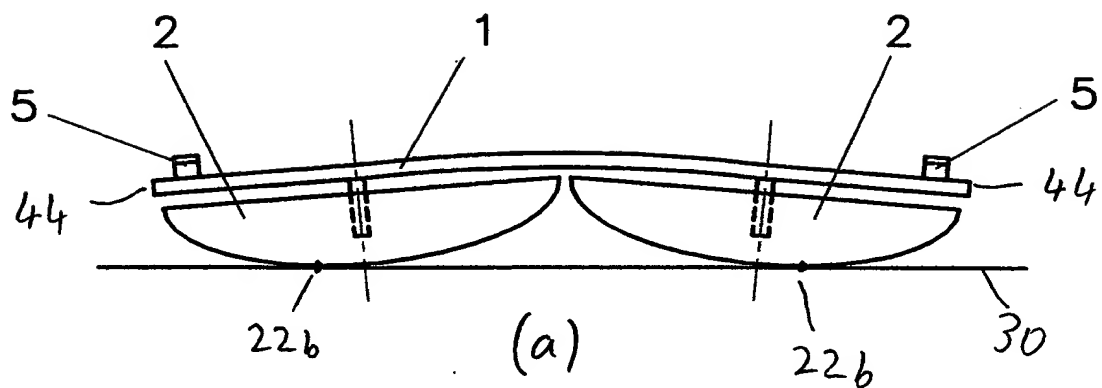


FIG.7

REPLACED

8/12

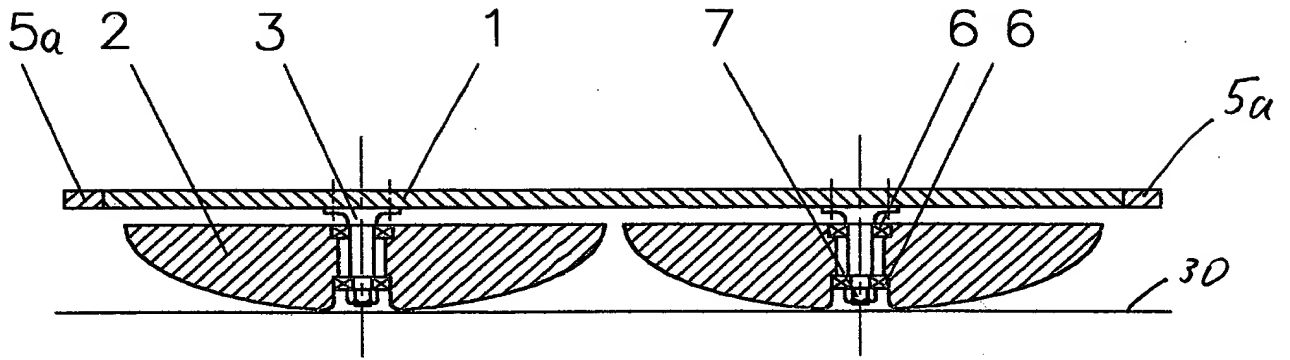


FIG. 8a

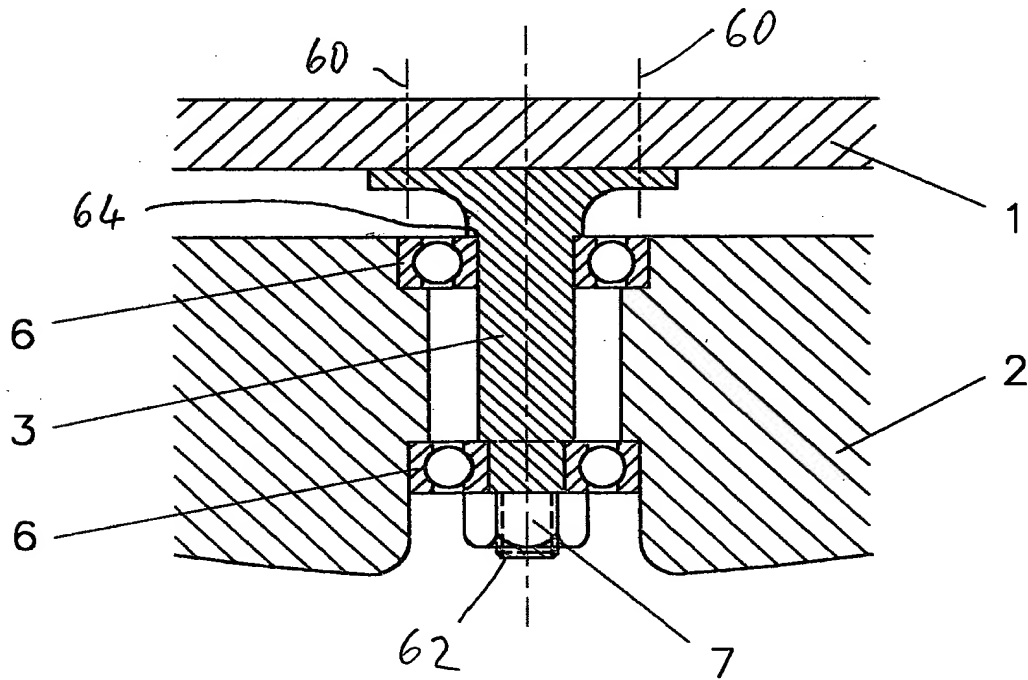


FIG. 8b

REPLACED

9/12

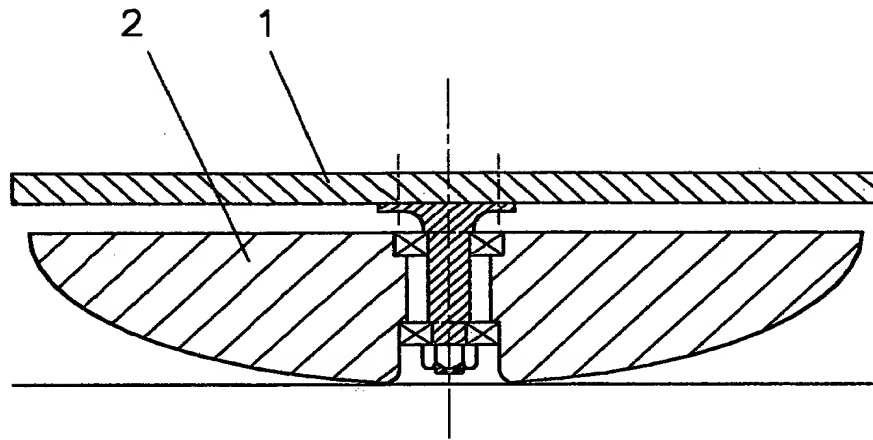


FIG.9

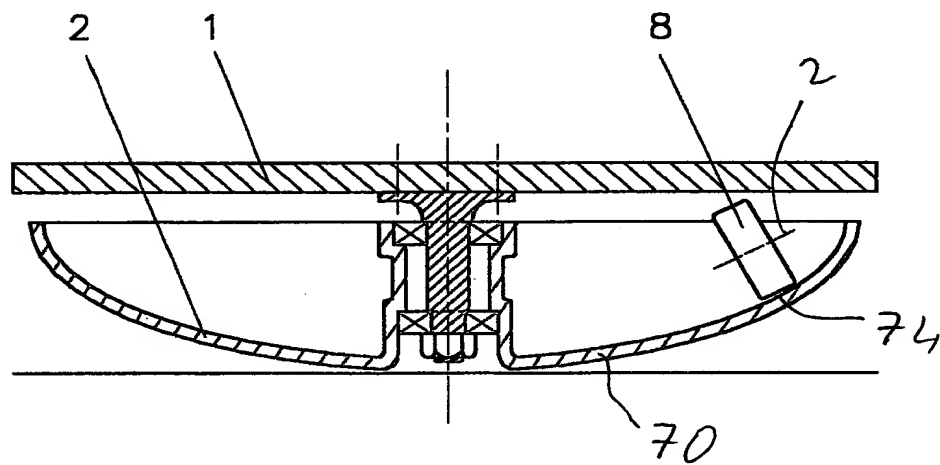


FIG.10

REPLACED

10/12

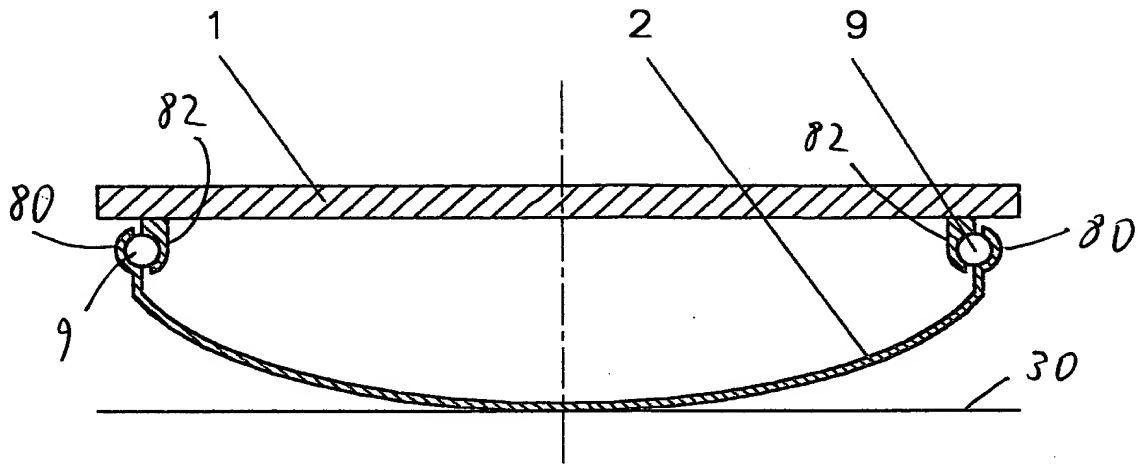


FIG. 11

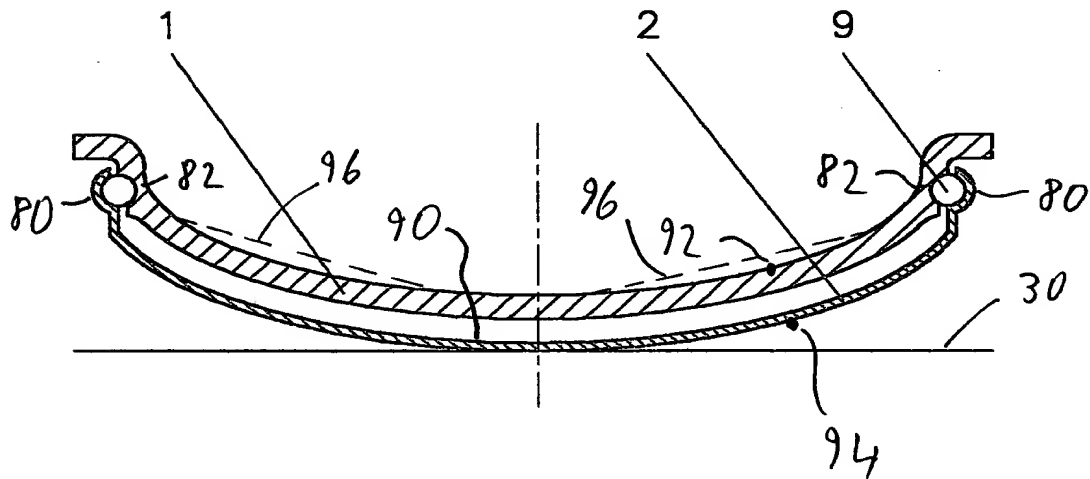


FIG. 12

REPLACED

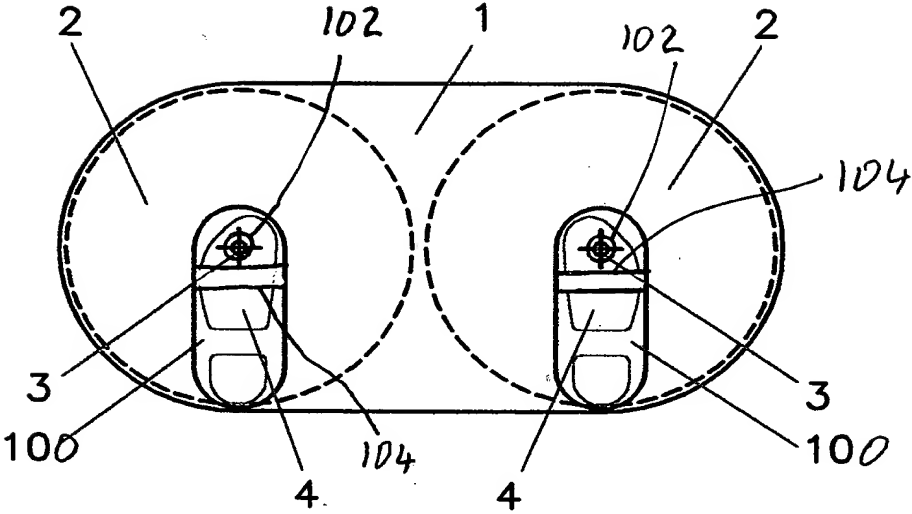


FIG. 14

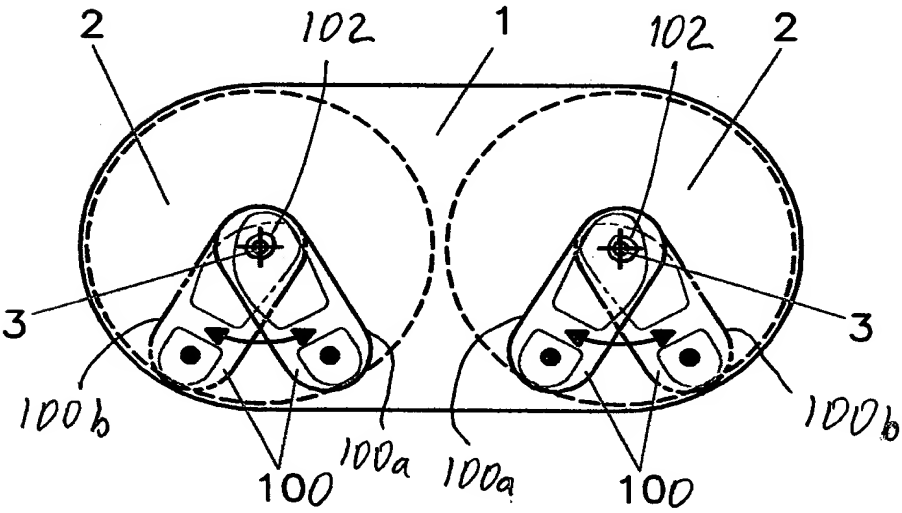


FIG. 15

REPLACED